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THE STATIC TELEPHONE. By A. E. DOLBEAR of College Hill, Mass.

[ABSTRACT.]

IN the static telephone, a ring of hard rubber is used within which are two parallel metal-plates separated by a body of air (a non-conductor), one plate connected with the line from the transmitter. The electrifying of one plate then causes attraction or repulsion of the free plate, and thus a sound in the receiver. This does away with magnetism. This system therefore requires a very large electro-motive force, and uses an induction coil of 2,000 ohms. A ground or return circuit is not needed here. The equivalent is the body itself. There is no passage of electricity from plate to plate: the action is purely inductive through space. The insulation is accomplished by the intervening air space, and by a coating of varnish, — an excellent di-electric. There is a device to charge the induction plates in connection with this instrument, which keeps it constantly up to its full possibilities. When this instrument is fully charged, and the electrical conditions are perfect, the receiver may be entirely disconnected from the transmitter, and sounds and conversation can still be heard, even across a room.

He also called attention to the fact, that instruments that have been in use work much better than new ones, as each plate acts as a condenser.[1]

NEW FORM OF SELENIUM CELL, WITH SOME REMARKABLE ELECTRICAL DISCOVERIES MADE BY ITS USE. By CHARLES E. FRITTS of New York, N. Y.

[ABSTRACT.]

THE author has invented an entirely new form of cell, having the following novel features: 1. Its resistance can be made as low as desired. Some cells have been made having a resistance as low as 9 ohms in the dark. 2. They are far more sensitive to light

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[1] The discussion following the reading of this paper is reported in SCIENCE of Aug. 24, p. 285.

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than any before known. One was cited which had fifteen times as much resistance in dark as in diffused daylight. 3. They show the other properties of selenium in a degree equally remarkable. 4. The light is caused to strike the selenium in the same plane or general direction as the current. 5. Their construction is such that they are easily handled and used, and form a practical working apparatus, both for scientific researches and technical uses. The cost when completed is about $100 each.

By experiments he has discovered: 1. That, by simply reversing the direction of a current through the cell, its resistance will become in some cases as much as ten or fifteen times as high as before. When the original direction of current is restored, its resistance falls again. This effect can be repeated any number of times. It is sensitive to light in both cases, but is generally more sensitive with the current entering the selenium at the same surface which the light is acting upon.

2. By changing the electromotive force of the current through the cell, its resistance is changed enormously. By substituting 23 Leclanché elements in place of 1, the resistance of a cell was in one case changed from 14,000 ohms to 4,600 ohms. On lowering the battery power the reverse effect is produced. This change can be produced as often as desired.

3. Very moderate changes of temperature (say 10° to 50° Fahr.) can change the resistance of a cell some hundreds or thousands of ohms in a few seconds. This change is temporary. The sensitiveness to light is greater when the cell is cold.

4. An intermittent current will produce the same effect. In one case it lowered the resistance of a cell from 50,000 ohms to 33,000 ohms almost instantly. But this change was permanent.

Mr. Fritts has produced a colorless transparent form of selenium, by subjecting pure selenium to high heat under pressure. It appears to be a better conductor even than the ordinary granular or crystalline form of selenium.

Other interesting discoveries were described, and the attention of physicists was called to these phenomena, as being worthy of careful study, and promising discoveries of the highest importance, both theoretically and practically, in return for properly conducted investigations.